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Full left ventricular coverage is essential for the accurate quantification of the area-at-risk by T1 and T2 mapping

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Abstract

© 2017 The Author(s). T2-weighted cardiovascular magnetic resonance (CMR) using a 3-slice approach has been shown to accurately quantify the edema-based area-at-risk (AAR) in ST-segment elevation myocardial infarction (STEMI). We aimed to compare the performance of a 3-slice approach to full left ventricular (LV) coverage for the AAR by T1 and T2 mapping and MI size. Forty-eight STEMI patients were prospectively recruited and underwent a CMR at 4 ± 2 days. There was no difference between the AAR full LV and AAR 3-slices by T1 (P = 0.054) and T2-mapping (P = 0.092), with good correlations but small biases and wide limits of agreements (T1-mapping: N = 30, R 2 = 0.85, bias = 1.7 ± 9.4% LV; T2-mapping: N = 48, R 2 = 0.75, bias = 1.7 ± 12.9% LV). There was also no significant difference between MI size 3-slices and MI size full LV (P = 0.93) with an excellent correlation between the two (R 2 0.92) but a small bias of 0.5% and a wide limit of agreement of ±7.7%. Although MSI was similar between the 2 approaches, MSI 3-slices performed poorly when MSI was < 0.50. Furthermore, using AAR 3-slices and MI size full LV resulted in 'negative' MSI in 7/48 patients. Full LV coverage T1 and T2 mapping are more accurate than a 3-slice approach for delineating the AAR, especially in those with MSI < 0.50 and we would advocate full LV coverage in future studies.

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